

ABSTRACT OF THE DISCLOSURE

Q12 An optical brancher branches an input optical signal into two. An optical detector converts one optical signal branched by the optical brancher into an electrical signal. A first controller generates a control electrical signal having a waveform obtained by inverting the envelope of the electrical signal. Based on the control electrical signal, an optical signal generator produces a dummy optical signal having a waveform λ_d and an amplitude $a/2$. The other signal branched by the optical brancher is delayed by a delay unit for a predetermined time, and then multiplexed by an optical multiplexer with the dummy optical signal from the optical signal generator. An optical amplifier amplifies a multiplexed optical signal. An optical filter separates an optical signal of a wavelength λ_1 from the amplified optical signal. Thus, optical signal amplification can be carried out without optical surges.